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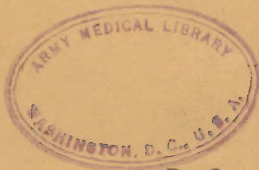
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MEMORANDUM
ON
SKIN COVER FOR WOUNDS
AND BURNS

1944



By Command of the Army Council,

W. D. Darnley

THE WAR OFFICE,
19th August, 1944.

INCLOSURE.....1 TO REPORT NO. 71483

MILITARY ATTACHE, LONDON

MEMORANDUM ON SKIN COVER FOR WOUNDS AND BURNS

Healing and Closure of Wounds.

It is generally agreed that *there is little scope for primary closure of wounds caused by missiles*. Three main considerations have brought about this general consensus of opinion.

- (a) Infection is introduced deeply into wounds by the missile: in the average compound transport or industrial injury the contamination is more often superficial.
- (b) The "time-lag" between receipt of the wound and primary operation is usually greater in the battle injury.
- (c) It is seldom possible for the wounded man to remain at the surgical centre which first deals with his wound and under the direct observation of the surgeon who operated. In other words, conditions which might permit of an occasional primary suture are extremely rare in the field.

The fact that some surgeons, particularly when treating battle casualties for the first time, are prone to forget these considerations, and to attempt primary closure, with dire consequences to the patient, has induced most medical directorates to place a complete ban on the procedure.

This perfectly correct and practical view has now created a large and urgent secondary problem, namely—the best methods to be employed, when the danger period is over, to obtain early closure with the minimum disability, deformity and loss of time.

It is abundantly plain for military, economic and many other reasons, that the most efficient methods should be practised on a wide scale to bring this about.

There has been a *laissez-faire* attitude to wounds in the later stages of healing, and this has been enhanced by the almost universal use of occlusive plasters. But it is now well known, if not sufficiently appreciated, that there is an optimum rather than a maximum time during which plaster immobilization produces benefit. Pus is not a good wound dressing. Epithelium is better than any antiseptic, and "closure" by skin cover is the quickest way of sterilizing a wound. "Skin cover" includes all the methods enumerated below.

It is recommended that consulting surgeons should bring to the notice of all surgeons in their commands the necessities for, and possibilities of, "delayed primary" suture, secondary suture and simple skin grafting. The simpler methods of skin grafting should be within the compass of and carried out by *all* surgeons. To this end

the following notes from the Hon. Consulting Surgeon (Plastic) to the Army are appended for guidance.

Methods of Closure Available.

1. Primary suture.

As stated above there is little, if any, place for this, except in certain carefully weighed circumstances and only then if the case can be retained under the personal care of the operator until danger is passed.

2. Delayed or secondary suture.

This procedure has a definite and useful place in the treatment of open wounds. It is correct to consider its use under the following conditions :—

- (a) When the bacteriological state of the wound is known to be under control (sterility cannot be expected).
- (b) When the loss of tissue, particularly skin, is small.
- (c) When the deeper tissues, especially muscle, can be brought together without undue tension, thus relieving the pull on the skin and ensuring union of edges.

A common cause of failure is suture of the skin under excessive tension which results in cutting out of the stitches, necrosis of skin edges and abscess formation in the "dead space" under the suture line.

3. Skin cover by free grafting.

This should be the method of choice in cases where the loss of tissue makes secondary suture impracticable or when secondary suture appears to be accompanied by too great a risk of failure.

4. Wound closure by sliding or transposed flaps.

A. Procedures recommended for all Surgeons.

- (i) Delayed or secondary suture.
- (ii) Free skin grafting.

Appropriate time for either method may be :—

- (i) *Immediate*—when the casualty occurs near a surgical centre and the wound is clinically "clean."
- (ii) *Within a day or two*—if the wound still appears relatively "clean" and the general condition of the patient is satisfactory.
- (iii) *Ten to fourteen days*—this was considered the optimum time in the Middle East.
- (iv) *Twenty-eight days*—which should be sufficient for the more severe cases.

All open granulating wounds should be closed or grafted before there develops that deep unabsorbable fibrous base which will neither heal by itself nor accept a graft, but which will later require a complicated plastic operation.

Indications for the use of free razor grafts.

Always with the proviso that the patient's general condition and that of the local wound are deemed satisfactory, these grafts may be applied to almost all wounds that cannot be closed easily by secondary suture, and to burns.

Optimum conditions.

Haemoglobin at least 80 per cent. Temperature normal. Oedema prevented or subsided.

Granulations pink and firm.

Bacteriological test satisfactory. (Complete sterility not necessary.)

Preparation of case to approach these conditions:—

(a) General—Blood transfusion as required.

Diet—plentiful and nourishing.

(b) Local—Saline compresses.

Acriflavine in hypertonic saline.

Firm pressure over Tulle Gras.

Sulphonamide, sulphathiazole or penicillin powder or paste.

Note on technique of grafting.

1. Spaced postage stamp razor grafts laid on Tulle Gras sheets ; especially useful when sepsis is anticipated.

2. Complete cover by razor grafts with perforations, and the grafts fixed if necessary by suture.

3. *Pressure dressing by:—*

(a) Layer of Tulle Gras. Dust with penicillin or sulphadiazine, sulphathiazole, etc.

(b) Layer of wool soaked in paraffin/flavine.

(c) Heavy layer of wet gauze pressed down. Crepe, plaster of Paris or other bandage.

4. *Elevation of part.*

Instruments.

Skin-grafting razor, Blair or Humby knife.

Hints on the use of skin-grafting knife.

Choose a flat, evenly presented surface of the required area. Stroke it with a lightly greased sterilized board which gives a good indication as to the flatness of the area. Apply moderate downward pressure with both hands, but the one carrying the knife can be much lighter.

Turn the edge of the knife slightly downwards and execute even strokes, parallel to the board edge. If the dermis is inadvertently cut through abandon the graft and cut another. Experience shows that different degrees of pressure are required with either hand according to variations in the toughness of the donor site and the sharpness of the knife. The most important asset is a sharp knife.

Donor areas.

Meticulous care should be taken that these are not infected.

Clean beforehand with cetavlon (or aether).

Use sterilized vaseline as lubricant.

Cover completely the whole area with Tulle Gras followed by a smear of 1 per cent. decicain if available, wet gauze, and firm bandage, which must be prevented from slipping by the appropriate use of strapping.

Do not disturb the dressing for ten days.

First dressing.

Take down, mop clean and re-apply penicillin (or sulphonamide) and pressure dressing.

Time—preferably on fifth day, but can be varied earlier or later according to clinical indications.

Failure of the free graft.

Failure will occasionally occur—total or in part. *Such failure is no serious setback*; the graft should be repeated after an interval during which further preparation is made.

Notes on the use of free grafts (where closure by whole thickness flaps cannot be employed).

(a) Amputation stumps and compound fractures with loss of skin.

Skin grafts will not take over bare bone, but it will often take over the soft tissue surrounding the bone and materially shorten the convalescence and reduce fibrosis.

When a compound fracture with loss of skin and muscle is under control and the granulations healthy, it may be regarded as a flesh wound requiring skin cover. The grafting should not be allowed to interfere with the proper treatment of the fracture, which in its turn will not normally jeopardize the success of the take. Even if there is a mild osteomyelitis present, the surrounding soft tissues should be covered.

(b) In gunshot wounds.

It is advisable to delay the skin cover at least until the first change of plaster. Skin graft can be included under closed plaster with success, but further experience of this method is desirable before assessing its value.

(c) In clean, accidental injuries. Immediate skin cover at the same time as the treatment of the fracture is indicated.

(d) *Avulsion flaps.*

These commonly occur in transport accidents, and if seen early should be grafted immediately. THE DEVITALIZED "U" FLAP of the trunk and limbs should very rarely be sutured back into position as gangrene almost invariably occurs. It should be cut off and either converted into a thin Wolfe graft or clean fresh grafts used to cover the wound. These avulsion flaps are found in the arm and forearm and finger, and occasionally the thigh and leg. When there is no flap free skin grafting is indicated at the earliest opportunity.

N.B.—Scalp.

Completely detached pieces do not survive if replaced. Partially detached flaps of the scalp and face should, however, be replaced.

B. Procedure recommended for Experienced General Surgeons.

Immediate or primary skin cover—Indications for the employment of a "direct flap."

When avulsion of skin in such regions as the hand (front or back), wrist or forearm up to the elbow, has damaged or laid bare tendons, nerves or joints, the area should be covered by an immediate abdominal flap. The "grenade hand" is an example. (See diagram.) If time permits the donor area should be skin-grafted. The decision to undertake such flap operations, should take into consideration the local situation in relation to the length of time it will be possible to keep the case under personal observation, and other general or local difficulties, associated with transport during evacuation.

The following types of limb wounds involving skin loss should be transferred to a plastic centre :—

- (i) *Lower leg, ankle and foot*—if bone and tendons are exposed, a cross leg flap is usually indicated.
- (ii) *Knee region*—if the defect is large either a cross leg or abdominal flap *via* the wrist will be required.
- (iii) *Popliteal region*—a free graft may suffice, but often the area requires a difficult repair by tube pedical graft.

N.B.—Rotation flaps are apt to be dangerous on the lower limb unless very carefully designed.

C. Types of Cases which should be treated at a Plastic Centre.

It is clearly both impractical and undesirable that all soft tissue wounds with skin loss (or burns) should be sent for treatment to a maxillo-facial or plastic centre. Many of these cases can and should be treated by the general surgeon. But when it is remembered that the treatment of many of these types of cases demands special technical skill, special equipment and experience, and sometimes the

co-operation of a dental surgeon and special training on the part of those who are to nurse them, it should be equally clear that it is wrong to deprive patients of these advantages by not transferring them to a centre. For these reasons it is advised that the following types of cases should be transferred to a special centre :—

- (i) *Injuries to the face*.—Severe wounds or burns, especially those involving the eyelids and complicated by fracture of the facial bones or jaws.
- (ii) *Extensive burns* (as soon as fit to travel). Particularly those involving the hands and face or flexures.
- (iii) *Extensive skin loss* (from any cause). The types mentioned in para. B. and in the region of the flexures and genitalia.
- (iv) *Chronic open wounds*, i.e. where attempts to obtain skin cover have failed after a reasonable period (say, two months).
- (v) *Contractures of deformities* due to skin loss.

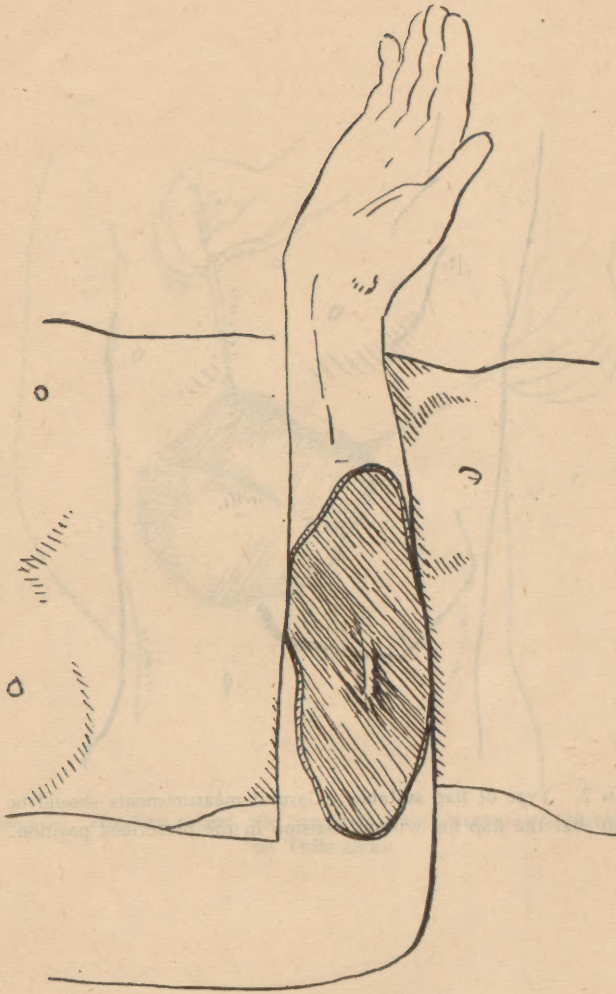


DIAGRAM 1. Large flesh wound of forearm.

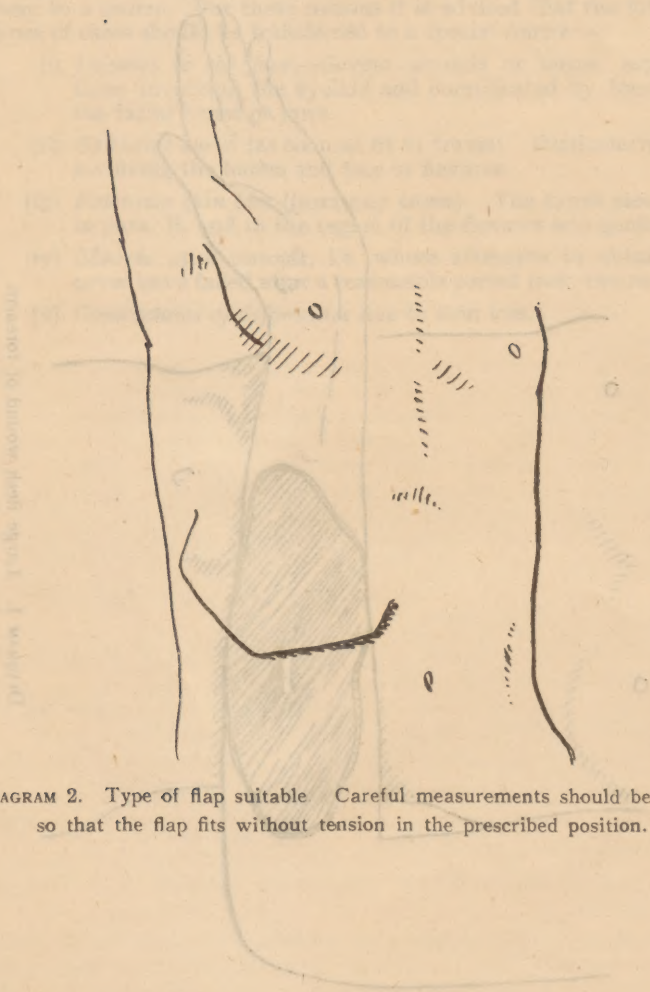


DIAGRAM 2. Type of flap suitable. Careful measurements should be made so that the flap fits without tension in the prescribed position.



DIAGRAM 3. The flap raised, the raw area (fascia) covered with skin graft on Tulle Gras.

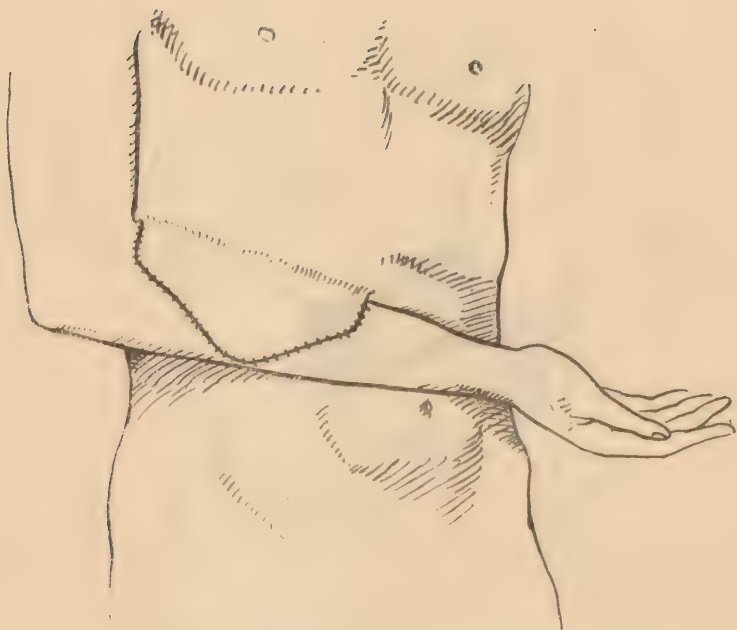


DIAGRAM 4. The suture.

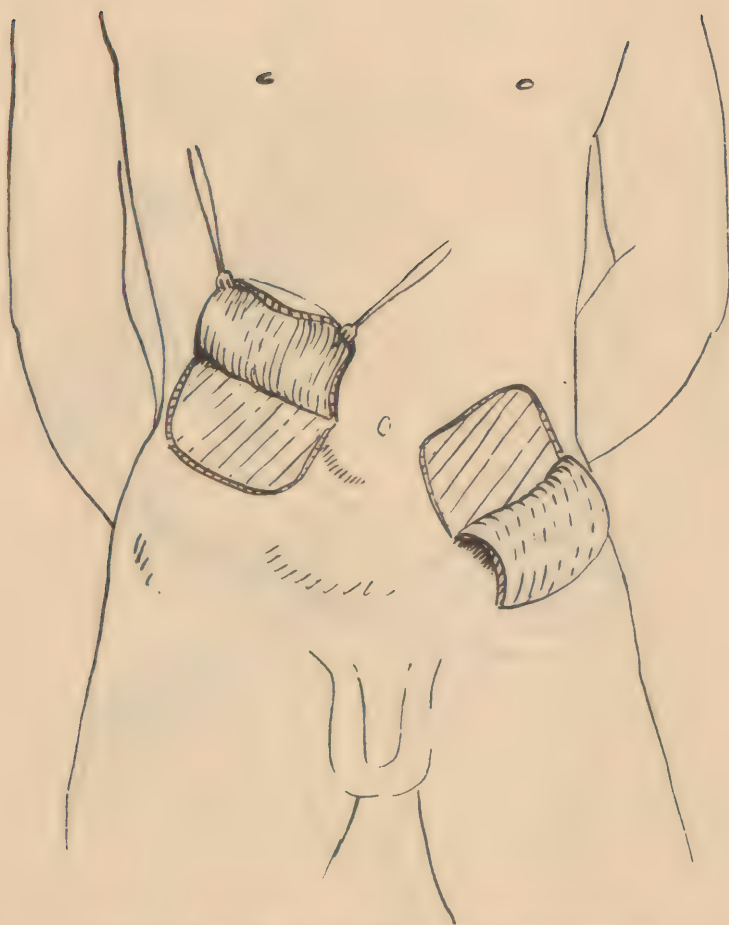


DIAGRAM 5. Two types of useful direct abdominal flaps.

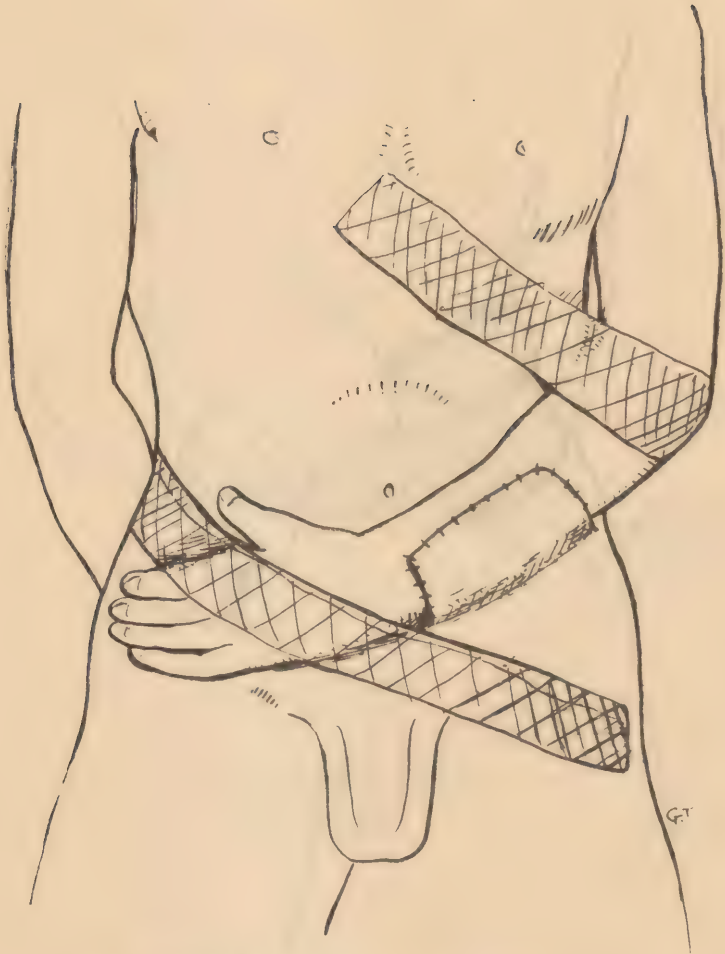


DIAGRAM 6. As applied to ulnar border.

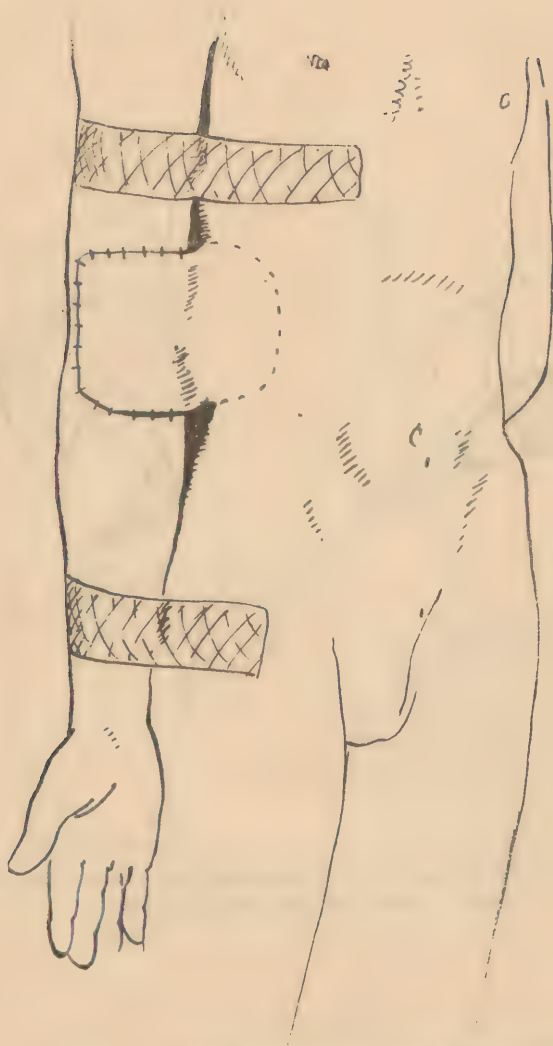


DIAGRAM 7. Suture. If more skin required base of flap extended as per dotted lines by partial separation at 2 weeks and full separation at 3.

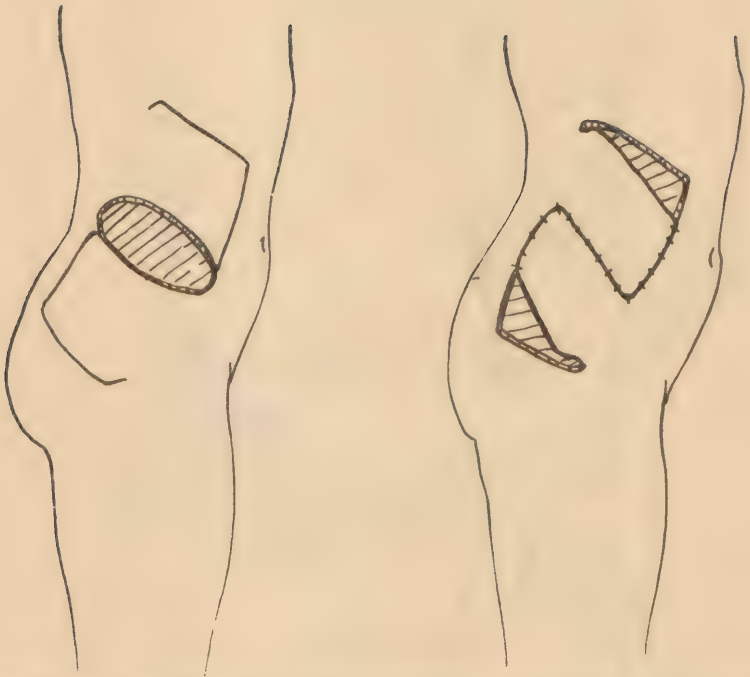


DIAGRAM 8. Types of flaps useful for large defects on abdomen and buttock region. Donor raw areas may be grafted.

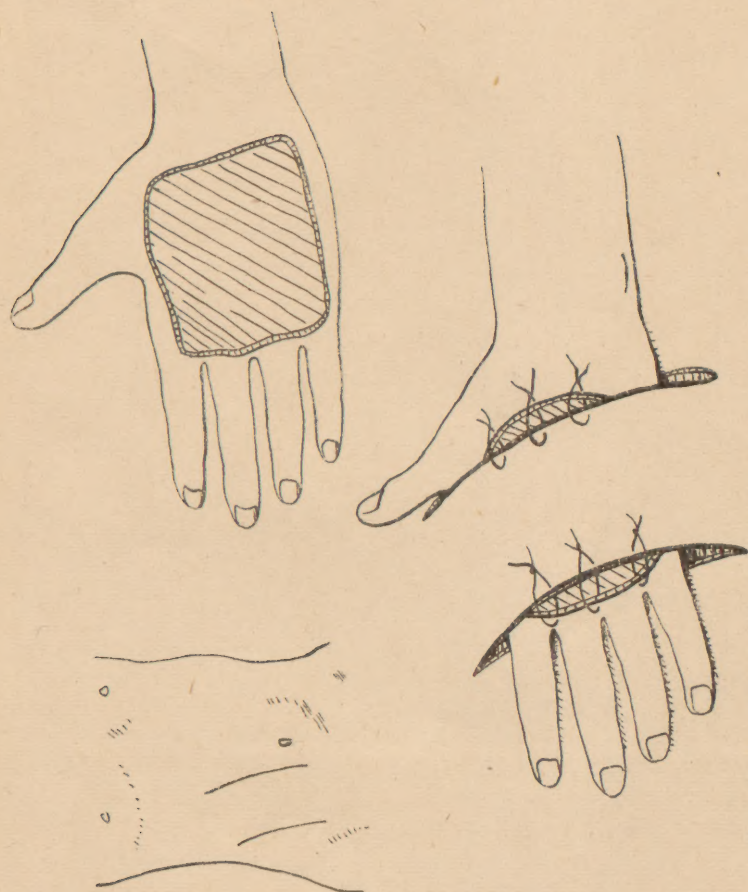


DIAGRAM 9. Double pedicle strap flap for back of hand when gross deep damage is present.

